Figure 1. mMRP amino acid sequence

1 MGSLFQEAEP QAGTEQNKPT LASRFQQTLG DLLARLGSRG HVYVIHCLNP

51 TPGKIPGLLD VGHVAEQLRQ AGILEIIGTR STHFPVRVSF QVFLARFHAL

101 GSGRQKAASD QERCGAILSE VLGAESPLYH LGVTQVLLQE QGWQQLEQLW

151 AQRRSQALLT LHRGLRACIT RQRLRLLPRM QARVRGLQAR KRYLQRRSAL

201 GQLNTILLVA RPLLRRRQKL RCAPGPHSGE PWGKVSNMDL GRLEIPAQLA

251 TLLERAEGHQ ALLTGSITES LPPEVPARPS LTLPPDIDQF PFSSFVSTSF

301 QKPFLPRPGQ PLDEPLTRLD GENPQQALEI NRVMLRLLGE GSLQSWQEQT

351 MGTFLVQQAQ RRPGLRDELF SQLVAQLWRN PDEQQNQRGW ALMVILLSSF

401 APTPALEKPL LKFVSDQAPS GMAALCQHKL LGALEQTPLA PMASRSHPPT

451 QLEWKAGLRR GRMALDVFTF NEESYSAEVE SWTTGEQFAG WILQSRGLEA

501 PPRGWSVSLH SGDAWRDLPG CDFVLDLIGQ TEDLGDPAGP HNYPITPLGL

551 AESIPPAPGV QAPSLPPGLP PGPAPILASS RPPGEASKPE NLDGFVDHLF

601 EPALAPGFSD LEQGWALSRR MKGGGSVGPT QQGYPMVYPG MVQAPSYQPA

651 MIPAPMPVMP AMGAVPTMPA MMVPPQPQPL VPSLDSRQLA LQQQNFINQQ

701 AMILAQQMTT QAMSLSLEQQ NQRHQHQAQT SGATSQPPPS TTAPKAKKPP

751 APQEKPESNL EPSGVGLRED TPEEAESKPQ RPKSFQQKRD YFQKMGQDPI

801 RVKTVKPPAK VQIPQEEMEE TEEEEDETAE LSPPPPPPPV VKKPLKASRP

851 KAVKEDEAEP AQEEVPTQGE DPPVHSSNSA PQHPKPSRVP PVQSSNSAPP

901 RPQPSREIRN IIRMYQSRPG PVAVPVQPTR PIKTFQKKND PKDEALAKLG

951 INGVHLPLST SPNQGKSSPP AVVPRPKARP RLEPSLSIQE KQGPLRDLFG

1001 PCSPNPPTAP APPPPPALPP PLSGEPKTPS VESHALTEPM EDKNISTKLL

1051 VPSGSVCFSY ANAPWKLFLR KEVFYPRENF SHPYCLSLLC QQILRDTFTE

1101 SCTRISQDER HKMKGLLGDL EVSLETLDIV EDSIKKRIVV AARDNWANYF

1151 SRIFPVSGES GSDVQLLGVS HRGLRLLKVT QSPSFHLDQL KTLCSYSYAE

1201 VLTVQCRGRS TLELSLKNEQ LILHTAWARA IKAMVDLFLS ELRKDSGYVI

1251 ALRSYITDDN SLLSFHRGDL IRLLPVTALE PGWQFGSAGG RSGLFPDDVV

1301 QPAAAPDLSF SLGKRNSWQR KSKLGPAQEV RKTEEVK*

Figure 2. cDNA sequence of mMRP (variant 1)

```
   1  CGCTGGGACT GTCACCTACC AGGTGCACAA GTTCATAAAC AGAAACAGGG
  51  GCCACCTGGA CCCCGCTGTG CTGGAGATGC TCAGGCAGAG CCAGCTGCAG
 101  GTGACCTAGC CTTCCTTTCA GCTCATGGGC AGCCTGTTCC AAGAAGCAGA
 151  GCCCCAGGCT GGGACTGAGC AAAACAAACC CACATTGGCC TCTCGATTCC
 201  AGCAGACCCT GGGTGACTTG CTAGCTCGGC TAGGCAGCAG GGGCCATGTC
 251  TACGTCATCC ACTGTCTCAA TCCCACCCCT GGAAAGATCC CAGGCCTCTT
 301  GGACGTGGGG CATGTGGCAG AGCAGCTGCG TCAGGCTGGC ATCCTGGAGA
 351  TCATAGGCAC CCGGAGTACC CACTTCCCCG TGCGAGTGTC CTTCCAAGTC
 401  TTTCTGGCAA GGTTCCATGC CCTGGGGTCA GGGAGACAGA AAGCTGCCTC
 451  TGACCAGGAG AGGTGTGGTG CCATCCTCAG TGAAGTGCTG GGGGCAGAGT
 501  CACCGCTGTA TCATCTTGGA GTCACCCAGG TCCTGCTGCA GGAACAGGGC
 551  TGGCAGCAGC TAGAACAGCT GTGGGCTCAG CGGCGCTCAC AGGCCCTGCT
 601  CACTCTGCAC CGTGGCCTCC GAGCCTGTAT CACCCGGCAG CGCCTCCGTC
 651  TCCTGCCCCG GATGCAGGCT CGTGTGCGTG GGCTCCAGGC CAGGAAGCGA
 701  TATCTCCAGC GGAGGTCAGC TCTGGGACAG CTGAACACCA TTCTCCTAGT
 751  GGCCCGGCCC CTGCTCCGGA GACGACAGAA GCTACGGTGT GCCCCTGGCC
 801  CGCACAGCGG GGAGCCCTGG GGGAAAGTGT CAAATATGGA CCTGGGTCGC
 851  TTAGAGATCC CCGCCCAGCT GGCTACTCTG CTGGAGAGGG CGGAAGGCCA
 901  CCAGGCCTTG CTGACGGGGA GCATCACAGA GTCCCTGCCA CCTGAGGTCC
 951  CCGCCCGGCC CAGCCTGACT CTCCCTCCAG ACATTGACCA GTTTCCCTTC
1001  TCCAGTTTTG TATCCACCAG CTTTCAGAAG CCATTTCTGC CTCGACCAGG
1051  GCAGCCACTG GACGAGCCCC TGACGCGGTT AGATGGCGAG AACCCTCAGC
```

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1151 CTGCAGTCCT GGCAAGAGCA GACCATGGGC ACGTTCCTCG TGCAGCAGGC

1201 CCAGCGACGG CCGGGACTCC GAGATGAGCT CTTCAGCCAG CTGGTGGCCC

1251 AGCTGTGGCG CAACCCAGAT GAGCAACAGA ATCAGCGTGG CTGGGCCCTA

1301 ATGGTGATCC TGCTCAGCTC CTTTGCTCCC ACACCTGCCC TGGAGAAGCC

1351 ACTGCTCAAA TTTGTATCTG ACCAGGCTCC CAGTGGCATG GCAGCCCTGT

1401 GCCAGCACAA GCTGTTAGGT GCCCTGGAGC AGACACCGCT GGCTCCCATG

1451 GCTTCGAGGT CCCACCCACC CACACAACTT GAGTGGAAGG CTGGTTTACG

1501 TCGGGGCCGC ATGGCGCTGG ATGTGTTCAC ATTCAACGAG GAAAGCTACT

1551 CCGCGGAAGT GGAATCCTGG ACCACGGGAG AGCAGTTTGC AGGGTGGATC

1601 CTACAGAGCA GAGGCCTGGA GGCGCCCCCT CGTGGCTGGT CTGTGTCACT

1651 GCATTCTGGG GATGCTTGGC GTGACTTGCC TGGCTGTGAC TTTGTGTTGG

1701 ACCTAATAGG CCAGACTGAG GACTTGGGAG ACCCAGCTGG TCCCCACAAC

1751 TACCCCATCA CTCCTCTTGG TTTAGCTGAG AGCATCCCTC CAGCCCCTGG

1801 TGTCCAGGCT CCTTCCCTGC CCCCAGGACT CCCTCCAGGT CCAGCCCCAA

1851 TACTGGCCAG CAGCCGCCCT CCGGGCGAGG CCAGTAAGCC TGAGAACCTG

1901 GATGGTTTCG TGGACCACCT CTTTGAACCA GCGCTCGCTC CGGGTTTCAG

1951 TGATCTGGAA CAAGGCTGGG CCCTGAGCAG ACGCATGAAG GGAGGGGGCT

2001 CTGTTGGGCC CACCCAGCAG GGCTACCCCA TGGTGTACCC AGGTATGGTG

2051 CAGGCACCTA GCTACCAGCC AGCTATGATA CCCGCACCGA TGCCCGTCAT

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2151 AGCCACAGCC TCTGGTGCCC AGTTTGGACT CAAGGCAGCT GGCACTACAG

2201 CAGCAAAACT TCATCAACCA GCAGGCGATG ATTCTGGCGC AGCAGATGAC

2251 CACCCAGGCC ATGAGCCTGT CCCTGGAGCA GCAGAATCAG AGACACCAGC

2301 ACCAAGCTCA GACCTCTGGG GCCACCTCCC AGCCTCCACC CTCAACCACT

2351 GCTCCCAAGG CCAAGAAGCC TCCTGCCCCC CAAGAGAAGC CAGAGAGTAA

2401 CCTAGAGCCT TCGGGTGTTG GCTTGAGAGA GGACACCCCA GAGGAAGCTG

2451 AAAGCAAGCC TCAGCGCCCC AAGAGCTTCC AACAGAAACG GGACTATTTC

2501 CAGAAGATGG GGCAAGATCC GATCAGAGTG AAGACGGTGA AACCTCCAGC

2551 CAAGGTTCAG ATCCCCCAAG AGGAGATGGA GGAGACGGAG GAGGAGGAGG

2601 ATGAGACCGC CGAGTTGTCC CCTCCTCCTC CCCCTCCCCC GGTTGTGAAG

2651 AAGCCGCTGA AGGCAAGCAG GCCCAAAGCC GTAAAGGAAG ATGAGGCAGA

2701 GCCCGCCCAG GAGGAAGTAC CGACCCAGGG CGAGGATCCC CCGGTGCACA

2751 GCTCCAACTC CGCACCTCAG CACCCCAAAC CCAGCAGGGT ACCCCCAGTG

2801 CAGAGCTCCA ACTCCGCACC TCCACGCCCG CAACCCAGCA GGGAAATCCG

2851 AAACATCATC CGAATGTACC AGAGCCGTCC AGGGCCTGTG GCTGTGCCCG

2901 TACAACCCAC CAGGCCCATC AAAACTTTTC AGAAGAAAAA TGACCCTAAG

2951 GATGAGGCTT TGGCTAAGTT AGGGATAAAT GGCGTCCACT TGCCCCTATC

3001 GACATCGCCT AACCAAGGGA AGAGCTCTCC ACCGGCTGTA GTTCCTCGAC

3051 CTAAGGCTCG ACCTCGTCTT GAGCCTTCCC TATCCATCCA GGAAAAGCAG

3101 GGACCCCTTC GGGACTTGTT TGGCCCATGT AGTCCAAACC CACCTACAGC

3151 TCCAGCACCC CCGCCTCCAC CAGCACTCCC ACCGCCTCTG TCTGGGGAGC

3201 CCAAGACCCC TTCAGTGGAG TCTCATGCCT TGACAGAGCC CATGGAGGAC

3251 AAGAACATCT CCACAAAGCT CCTTGTGCCC TCTGGAAGTG TGTGCTTCTC

3301 CTATGCCAAT GCACCCTGGA AGTTGTTCTT ACGCAAGGAG GTGTTCTACC

3351 CCCGGGAGAA CTTCAGTCAT CCATACTGCC TCAGTCTCCT CTGCCAGCAG

3401 ATCCTGCGGG ACACCTTCAC AGAGTCCTGC ACCCGGATCT CACAGGATGA

3451 GCGGCACAAA ATGAAAGGCC TTCTGGGAGA CTTGGAGGTG AGTCTGGAGA

3501 CCCTTGACAT TGTTGAAGAC AGCATCAAAA AACGCATCGT GGTCGCTGCT

3551 CGGGACAACT GGGCCAATTA CTTCTCCCGC ATCTTCCCAG TCTCGGGTGA

3601 GAGTGGCAGC GATGTACAGC TGCTGGGTGT GTCTCACCGG GGACTGCGGC

3651 TGCTGAAGGT GACCCAAAGC CCGAGCTTCC ACCTGGACCA GCTGAAGACA

3701 CTCTGTTCCT ACAGCTATGC TGAAGTCCTG ACCGTGCAGT GCAGGGGCAG

3751 ATCCACCCTG GAGCTGTCCT TGAAGAATGA GCAGCTGATA CTGCACACAG

3801 CCTGGGCGAG GGCCATCAAG GCCATGGTGG ATCTATTTCT GAGTGAACTC

3851 AGGAAGGACT CCGGCTATGT CATCGCCCTG CGCAGCTACA TCACCGATGA

3901 CAATAGCCTC CTCAGTTTCC ACCGTGGGGA CCTCATTAGG TTACTGCCAG

3951 TGACCGCTCT GGAACCAGGC TGGCAGTTCG GTTCTGCCGG GGGCCGCTCC

4001 GGACTCTTTC CCGATGACGT GGTGCAGCCA GCTGCTGCCC CCGACCTCTC

4051 CTTTTCCCTG GGAAAGAGAA ACAGCTGGCA ACGCAAGAGT AAGCTGGGGC

4101 CAGCTCAGGA GGTGAGGAAG ACAGAAGAGG TGAAGTGATA CAGGCCTAAC

4151 TTGGAGACTG AGAAGGAAAG AGCAGGGTTG CTTCGGGTGT TGTCCACTTC

4201 CTGTCCTGGT GGCCAGGGCT CAATGTGTTC CTGTCCTTTA CCATCTCCTG

4251 ACTTTTTGCC ATTTGTGAGA CTGTAAGTCA CACCCTCTAA CTCTGGTACT

4301 TAGTTCAGTG TCTCCATAGA GGATGCTTAA TAAATAACCT TGGTTTTCCT

4351 GGTTTCTGGT GTCACTCCTC TTGGGTCTAA TGGGTATGGG GACCAGGGCC

4401 TGAGAGTGAG TATTGGGCCT CTGGGCTAGA TGGTGGGTAC TGGGGTGGTA

4451 CCAAATTTCC TGTGCTCCCA GCGCCCCACC CATCCCAGGA AACAAGAACC

4501 CAGTGAAGAC TCGGAGGCCA CCTCCTTTAC AACCTACAGC TCTTTGTCTG

4551 CCGACCCCCA CAACTACACC ATGCAGGAAT TTGCCCTGCG CTATTTCCGG

4601 AAGCCTCATA CCTGGCTGAC CCAGATGAGT AGAGACACCA AAGAGAAAGC

4651 TGCCATCAAC CTGATCCAGT ACACTAAGGA CCCCATCCAG GAATCCCTTA

4701 CCAGCTTCTG CAATGGGGAC ACAAACAGTA AAGCTGTGGC TGGCTTCAAG

4751 GCTCTGATGC AGTTTATGGG GGACCAGCCT AAGCCCCGGG GCAAGGACGA

4801 GCTGAGTCTG CTCTATGAGC TGCTGAAGCT GTGCCAAGAT GACCTTAGGG

4851 ACGAGATGTA CTGCCAGGTC ATCAAGCAAG TCACAGGACA CCCCCAGCCA

4901 AAGCACTGTG CTCTGGGCTG GAGCGTCCTC AGCCTCTTCA CAGGCTTCTT

4951 TGCACCATCG ACCACGCTGA TGCCCTATGT GACCAAGTTC CTGCAGGATT

5001 CCAGCCCCAG TGAAGAGTTG GCCAGGAGGA GCCAGGAGAA CCTCCAGCGC

5051 ACAGTTAAAT ATGGGGGACG CCAGCAGCTG CCGTTACCTG GTGAAATGAA

5101 TGCTTTTCTG AAAGGGCAAG CAGTTCGTTT GCTTCTAATT CACCTGCCTG

5151 GGGGTGTGGA CTACAGGACG AATTCACAGA CATTCACAGT GGCAGGGGAA

5201 GTGCTAGAGG AGCTGTGTGG ACAGATGGGC ATCACAGACT TGGAAGAAGT

5251 GCAGGAATTT GCCCTCTTTC TCATCAAAGG AGAAGGTGAG CTGGTTCGGC

5301 CGCTGTCACC CCATGAGTAC ATCAACAATG TGGTGACGGA CCAGGACATG

5351 AGCCTTCACA GCCGACGGCT TGGTTGGGAG ACTCCACTGC ATTTTGATCA

5401 CTCCACCTAC ACGGAAACCC ACTATGGCCA GGTGCTTCGG GACTACCTGC

5451 AAGGGAAGCT GATAGTCAGC ACCCAGGCAG AGGCTCTACT TGCCCAGCTT

5501 GCTGCCTTCC AACACTTCGA CAAAACCGGA ACTTCTAGTC CTCCATCAGA

5551 GCAAGAGCTG CTGTCTTATA TTCCCAAGCC ACTGCAATGG CAGGTGAACA

5601 CAGCCAACAT AAAGAGCTTG GTGACCCAGG AGCTGAGGCA GATGCAAGGG

5651 TACAGCAAGC AGAGAGCACA GATTGGCTTT ATAGAGAGCA CAGCGCAGCT

5701 GCCCCTCTTT GGCTACACTG TGTACGTAGT GCTGAGAGTG AGTAAGCTGG

5751 CCCTCCCTGG ACCAGGCCTC CTGGGGCTGA ACCGTCAGCA CCTGGTCCTC

5801 ATGGACCCCA GCTCTCAGGA ACTCTGCTGC TCTGTCATGC TAAAAGACCT

5851 GAAGCAGTTC CACCTGCTGA GCCCACTGCA GGAGGACGGG CCCCCTGGCC

5901 TAGAACTCAA CTATGGCTCT GTTGACAACC CCCAGACCAT CTGGTTGGAG

5951 TTGCCACAGG CCCAGGAGCT GCAGCACACC ATCATCTTCC TGCTGGGCAG

6001 CATGTCCACT CAGTGGCCAG GTCTCCTCTG AGGAGTGGAG ATAAGGCAGC

6051 GGTCTCTCAC TGGGCAGTCT GCCTTAGTCC TGCTCTGAAT CCGCTGCACA

6101 ACCCCCCACC CCACGTGGAG GCCAAAAGGC AAAGTTGTGT CACCTGGGAG

6151 AATAGGCAGA CACATCCCCT CTGGGGTGGA CTGCAACAGG AGTTGGGGCA

6201 TTTGCTGGCT AGCCCCAGGG AAAATGCCCA CCCAGCTCGA AAGCGGCACA

6251 AGTAAAACAC CCAAGGAAAA AAAAAAAAAA AAAAAAAAAA AAA

Figure 3. cDNA sequence of mMRP (variant 2)

```
   1  CGCTGGGACT GTCACCTACC AGGTGCACAA GTTCATAAAC AGAAACAGGG
  51  GCCACCTGGA CCCCGCTGTG CTGGAGATGC TCAGGCAGAG CCAGCTGCAG
 101  GTGACCTAGC CTTCCTTTCA GCTCATGGGC AGCCTGTTCC AAGAAGCAGA
 151  GCCCCAGGCT GGGACTGAGC AAAACAAACC CACATTGGCC TCTCGATTCC
 201  AGCAGACCCT GGGTGACTTG CTAGCTCGGC TAGGCAGCAG GGGCCATGTC
 251  TACGTCATCC ACTGTCTCAA TCCCACCCCT GGAAAGATCC CAGGCCTCTT
 301  GGACGTGGGG CATGTGGCAG AGCAGCTGCG TCAGGCTGGC ATCCTGGAGA
 351  TCATAGGCAC CCGGAGTACC CACTTCCCCG TGCGAGTGTC CTTCCAAGTC
 401  TTTCTGGCAA GGTTCCATGC CCTGGGGTCA GGGAGACAGA AAGCTGCCTC
 451  TGACCAGGAG AGGTGTGGTG CCATCCTCAG TGAAGTGCTG GGGGCAGAGT
 501  CACCGCTGTA TCATCTTGGA GTCACCCAGG TCCTGCTGCA GGAACAGGGC
 551  TGGCAGCAGC TAGAACAGCT GTGGGCTCAG CGGCGCTCAC AGGCCCTGCT
 601  CACTCTGCAC CGTGGCCTCC GAGCCTGTAT CACCCGGCAG CGCCTCCGTC
 651  TCCTGCCCCG GATGCAGGCT CGTGTGCGTG GGCTCCAGGC CAGGAAGCGA
 701  TATCTCCAGC GGAGGTCAGC TCTGGGACAG CTGAACACCA TTCTCCTAGT
 751  GGCCCGGCCC CTGCTCCGGA GACGACAGAA GCTACGGTGT GCCCCTGGCC
 801  CGCACAGCGG GGAGCCCTGG GGGAAAGTGT CAAATATGGA CCTGGGTCGC
 851  TTAGAGATCC CCGCCCAGCT GGCTACTCTG CTGGAGAGGG CGGAAGGCCA
 901  CCAGGCCTTG CTGACGGGGA GCATCACAGA GTCCCTGCCA CCTGAGGTCC
 951  CCGCCCGGCC CAGCCTGACT CTCCCTCCAG ACATTGACCA GTTTCCCTTC
1001  TCCAGTTTTG TATCCACCAG CTTTCAGAAG CCATTTCTGC CTCGACCAGG
1051  GCAGCCACTG GACGAGCCCC TGACGCGGTT AGATGGCGAG AACCCTCAGC
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1151 CTGCAGTCCT GGCAAGAGCA GACCATGGGC ACGTTCCTCG TGCAGCAGGC

1201 CCAGCGACGG CCGGGACTCC GAGATGAGCT CTTCAGCCAG CTGGTGGCCC

1251 AGCTGTGGCG CAACCCAGAT GAGCAACAGA ATCAGCGTGG CTGGGCCCTA

1301 ATGGTGATCC TGCTCAGCTC CTTTGCTCCC ACACCTGCCC TGGAGAAGCC

1351 ACTGCTCAAA TTTGTATCTG ACCAGGCTCC CAGTGGCATG GCAGCCCTGT

1401 GCCAGCACAA GCTGTTAGGT GCCCTGGAGC AGACACCGCT GGCTCCCATG

1451 GCTTCGAGGT CCCACCCACC CACACAACTT GAGTGGAAGG CTGGTTTACG

1501 TCGGGGCCGC ATGGCGCTGG ATGTGTTCAC ATTCAACGAG GAAAGCTACT

1551 CCGCGGAAGT GGAATCCTGG ACCACGGGAG AGCAGTTTGC AGGGTGGATC

1601 CTACAGAGCA GAGGCCTGGA GGCGCCCCCT CGTGGCTGGT CTGTGTCACT

1651 GCATTCTGGG GATGCTTGGC GTGACTTGCC TGGCTGTGAC TTTGTGTTGG

1701 ACCTAATAGG CCAGACTGAG GACTTGGGAG ACCCAGCTGG TCCCCACAAC

1751 TACCCCATCA CTCCTCTTGG TTTAGCTGAG AGCATCCCTC CAGCCCCTGG

1801 TGTCCAGGCT CCTTCCCTGC CCCCAGGACT CCCTCCAGGT CCAGCCCCAA

1851 TACTGGCCAG CAGCCGCCCT CCGGGCGAGG CCAGTAAGCC TGAGAACCTG

1901 GATGGTTTCG TGGACCACCT CTTTGAACCA GCGCTCGCTC CGGGTTTCAG

1951 TGATCTGGAA CAAGGCTGGG CCCTGAGCAG ACGCATGAAG GGAGGGGGCT

2001 CTGTTGGGCC CACCCAGCAG GGCTACCCCA TGGTGTACCC AGGTATGGTG

2051 CAGGCACCTA GCTACCAGCC AGCTATGATA CCCGCACCGA TGCCCGTCAT

2101 GCCAGCCATG GGCGCAGTCC CAACCATGCC AGCCATGATG GTGCCACCCC

2151 AGCCACAGCC TCTGGTGCCC AGTTTGGACT CAAGGCAGCT GGCACTACAG

2201 CAGCAAAACT TCATCAACCA GCAGGCGATG ATTCTGGCGC AGCAGATGAC

2251 CACCCAGGCC ATGAGCCTGT CCCTGGAGCA GCAGAATCAG AGACACCAGC

2301 ACCAAGCTCA GACCTCTGGG GCCACCTCCC AGCCTCCACC CTCAACCACT

2351 GCTCCCAAGG CCAAGAAGCC TCCTGCCCCC CAAGAGAAGC CAGAGAGTAA

2401 CCTAGAGCCT TCGGGTGTTG GCTTGAGAGA GGACACCCCA GAGGAAGCTG

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2501 CAGAAGATGG GGCAAGATCC GATCAGAGTG AAGACGGTGA AACCTCCAGC

2551 CAAGGTTCAG ATCCCCCAAG AGGAGATGGA GGAGACGGAG GAGGAGGAGG

2601 ATGAGACCGC CGAGTTGTCC CCTCCTCCTC CCCCTCCCCC GGTTGTGAAG

2651 AAGCCGCTGA AGGCAAGCAG GCCCAAAGCC GTAAAGGAAG ATGAGGCAGA

2701 GCCCGCCCAG GAGGAAGTAC CGACCCAGGG CGAGGATCCC CCGGTGCACA

2751 GCTCCAACTC CGCACCTCAG CACCCCAAAC CCAGCAGGGT ACCCCCAGTG

2801 CAGAGCTCCA ACTCCGCACC TCCACGCCCG CAACCCAGCA GGGAAATCCG

2851 AAACATCATC CGAATGTACC AGAGCCGTCC AGGGCCTGTG GCTGTGCCCG

2901 TACAACCCAC CAGGCCCATC AAAACTTTTC AGAAGAAAAA TGACCCTAAG

2951 GATGAGGCTT TGGCTAAGTT AGGGATAAAT GGCGTCCACT TGCCCCTATC

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3051 CTAAGGCTCG ACCTCGTCTT GAGCCTTCCC TATCCATCCA GGAAAAGCAG

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3151 TCCAGCACCC CCGCCTCCAC CAGCACTCCC ACCGCCTCTG TCTGGGGAGC

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3251 AAGAACATCT CCACAAAGCT CCTTGTGCCC TCTGGAAGTG TGTGCTTCTC

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3651 TGCTGAAGGT GACCCAAAGC CCGAGCTTCC ACCTGGACCA GCTGAAGACA

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3751 ATCCACCCTG GAGCTGTCCT TGAAGAATGA GCAGCTGATA CTGCACACAG

3801 CCTGGGCGAG GGCCATCAAG GCCATGGTGG ATCTATTTCT GAGTGAACTC

3851 AGGAAGGACT CCGGCTATGT CATCGCCCTG CGCAGCTACA TCACCGATGA

3901 CAATAGCCTC CTCAGTTTCC ACCGTGGGGA CCTCATTAGG TTACTGCCAG

3951 TGACCGCTCT GGAACCAGGC TGGCAGTTCG GTTCTGCCGG GGGCCGCTCC

4001 GGACTCTTTC CCGATGACGT GGTGCAGCCA GCTGCTGCCC CCGACCTCTC

4051 CTTTTCCCTG GGAAAGAGAA ACAGCTGGCA ACGCAAGAGT AAGCTGGGGC

4101 CAGCTCAGGA GGTGAGGAAG ACAGAAGAGG TGAAGTGATA CAGGCCTAAC

4151 TTGGAGACTG AGAAGGAAAG AGCAGGGTTG CTTCGGGTGT TGTCCACTTC

4201 CTGTCCTGGT GGCCAGGGCT CAATGTGTTC CTGTCCTTTA CCATCTCCTG

4251 ACTTTTTGCC ATTTGTGAGA CTGTAAGTCA CACCCTCTAA CTCTGGTACT

4301 TAGTTCAGTG TCTCCATAGA GGATGCTTAA TAAATAACCT TGGTTTTCCT

4351 GGAAAAAAAA AAAAAAAAA AAAAA

Figure 4. ORF HMRP1 partial amino acid sequence--longer clone (437aa)

MYQSRPGPVPVPVQPSRPPKAFLRKIDPKDEALAKLGINGAHSSPPMLSPSPGKGPPPAVAPRPKA
PLQLGPSSSIKEKQGPLLDLFGQKLPIAHTPPPPPAPPLPLPEDPGTLSAERRCLTQPVEDQGVST
QLLAPSGSVCFSYTGTPWKLFLRKEVFYPRENFSHPYYLRLLCEQILRDTFSESCIRISQNERRKM
KDLLGGLEVDLDSLTTTEDSVKKRIVVAARDNWANYFSRFFPVSGESGSDVQLLAVSHRGLRLLKV
TQGPGLRPDQLKILCSYSFAEVLGVECRGGSTLELSLKSEQLVLHTARARAIEALVELFLNELKKD
SGYVIALRSYITDNCSLLSFHRGDLIKLLPVATLEPGWQFGSAGGRSGLFPADIVQPAAAPDFSFS
KEQRSGWHKGQLSNGEPGLARWDRASEVRKMGEGQAEARPA

Figure 5. hMRP1 partial DNA sequence--longer clone 4174 bp

CGGCAGCAGCAGGCTCGGGCCTCCGAGGCTGCGTCCCAGGCCTCACCCTCAGCCGTCACCTCCAAG
CCCAGGAAGCCCCCCACACCCCCGGAGAAGCCACAGCGTGACCTGGGATCAGAGGGTGGCTGCCTG
AGGGAGACCTCCGAGGAGGCTGAAGACAGGCCCTATCAGCCCAAGAGCTTCCAGCAGAAACGGAAC
TATTTCCAGAGGATGGGGCAGCCACAGATCACAGTGAGGACGATGAAGCCCCCGGCCAAGGTCCAC
ATCCCCCAGGGGGAAGCGCAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGCAGGAGGAGCAA
GAAGTGGAAACAAGAGCAGCGCCGTCCCCTCCTCCTCCCCCCATCGTGAAGAAGCCATTGAAGCAA
GGTGGGGCCAAAGCTCCAAAAGAGGCTGAGGCTGAGCCAGCCAAGGAGACAGCGGCCAAGGGCCAT
GGCCAAGGGCCAGCCCAAGGCAGGGGGACTGTGGTGCGCAGTCAGACTCCAAGCCCAAGCGGCCAC
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CCAAGCTGGGTATCAACGGTGCCCACTCGTCCCCGCCGATGCTGTCCCCCAGCCCAGGAAAGGGCC
GCCCGCCAGCTGTGGCTCCTCGACCCAAGGCCCCGCTACAGCTTGGGCCCTCTAGCTCCATCAAGG
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CACCAGCGCCACCACTGCCTCTGCCCGAGGACCCAGGGACCCTTTCAGCAGAGCGTCGTTGCTTGA
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CCTACACCGGCACGCCCTGGAAGTTGTTCCTACGCAAGGAGGTGTTCTACCCACGGGAGAACTTCA
GCCATCCCTACTACCTGAGGCTCCTCTGTGAGCAGATCCTACGGGACACCTTCTCCGAGTCCTGTA
TCCGGATTTCCCAGAATGAGCGGCGGAAAATGAAAGACCTGCTGGGAGGCTTGGAGGTGGACCTGG
ATTCTCTCACCACCACCGAAGACAGCGTCAAGAAGCGCATCGTGGTGGCCGCTCGGGACAACTGGG
CCAATTACTTCTCCCGCTTCTTTCCTGTCTCGGGCGAGAGTGGCAGCGACGTGCAGCTGTTAGCCG
TGTCCCACCGTGGGCTGCGACTGCTCAAGGTGACCCAAGGCCCCGGCCTCCGCCCCGACCAGCTGA
AGATTCTCTGCTCATACAGCTTTGCGGAGGTGCTGGGTGTGGAGTGCCGGGGCGGCTCCACCCTGG
AGCTGTCACTGAAGAGCGAGCAGCTGGTGCTGCACACAGCCCGGGCAAGGGCCATCGAGGCGCTGG
TTGAGCTATTCCTGAATGAGCTTAAGAAGGACTCCGGCTATGTCATCGCCCTGCGCAGCTACATCA
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TGGAGCCAGGCTGGCAGTTTGGCTCTGCCGGGGGCCGTTCCGGACTCTTTCCTGCCGACATAGTGC
AGCCGGCTGCCGCTCCCGACTTTTCCTTCTCCAAGGAGCAGAGGAGTGGCTGGCACAAGGGTCAGC
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GACAAGCAGAGGCAAGGCCTGCCTGAGACTGAGGAAGGAAAGGGGTTTGACCACTCCCGAGGCTGC
CATGCGGTGGGACCACCCTGCTGTCCGTCTCCTGTGGCTGCCCCTCTGCCCGCTCCTGATGGCTCG
CCTTGTCTCTCCAGCAAGACTGTGCACTCCTTGCAGGCAGGGGCTGGGCTGGATGCTGCTCTTGTG

TCCCACGTGGTACTTAGTTCAAGGCTGCCCCAGCAGATGCTTAATAAACAGCTCTTCACTTTCCTG
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AGGGCACTGGACACTCAGGTGGCACCAGGTTTCTTGTGATCCCAGCGCCCTGCCCACCCTTGGAGC
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TCCCACAGCTACACCATGCAGGAATTCGCCCGGCGTTACTTCCGGAGGTCCCAGGCCTTGCTGGGC
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CAGGAGTCGCTCCTCAGCCTCAGTGATGATGTGAGCAAGCTGGCTGTAGCCAGCTTCCTGGCCCCT
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GCTGAAGCTGTGCCAGCAGGAGAAGCTGAGGGATGAGATTTACTGCCAGGTTATCAAGCAGGTCAC
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CGTGAGCCTGCACAGCCGGCGGCTCCACTGGGAGACCCCACTGCACTTCGATAACTCCACCTACAT
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GCAAAGAAAACAGCCAGACCCTCTCCAGGACGGCCTGGGGCCAAAGCGGGCTGCAGGAACTCGGCT
GGGGCACCTGAGGTTGCCCAGTCTGAGGGAGATGCCCACCCGACCCCAGGCTCCGCCCAGGCCCCA

CATTAGCACAAGCCCAGGCATGGGAGAAACAGCTGCTGAGGAAATAAAACTCCCTAAAAAAAAAAA

AAAAAAAAAAAAAAAA

Figure 6. ORF hMRP2 partial amino acid sequence --shorter clone (786aa)

MYQSRPGPVPVPVQPSRPPKAFLRKIDPKDEALAKLGINGAHSSPPMLSPSPGKGPPPAVAPRPKA
PLQLGPSSSIKEKQGPLLDLFGQKLPIAHTPPPPPAPPLPLPEDPGTLSAERRCLTQPVEDQGVST
QLLAPSGSVCFSYTGTPWKLFLRKEVFYPRENFSHPYYLRLLCEQILRDTFSESCIRISQNERRKM
KDLLGGLEVDLDSLTTTEDSVKKRIVVAARDNWANYFSRFFPVSGESGSDVQLLAVSHRGLRLLKV
TQGPGLRPDQLKILCSYSFAEVLGVECRGGSTLELSLKSEQLVLHTARARAIEALVELFLNELKKD
SGYVIALRSYITDNCSLLSFHRGDLIKLLPVATLEPGWQFGSAGGRSGLFPADIVQPAAAPDFSFS
KEQRSGWHKGQLSNGEPGLARWDRASERPAHPWSQAHSDDSEATSLSSVAYAFLPDSHSYTMQEFA
RRYFRRSQALLGQTDGGAAGKDTDSLVQYTKAPIQESLLSLSDDVSKLAVASFLALMRFMGDQSKP
RGKDEMDLLYELLKLCQQEKLRDEIYCQVIKQVTGHPRPEHCTRGWSFLSLLTGFFPPSTRLMPYL
EKFLQDSGPSQELARSSQEHLQRTVKYGGRRRMPPPGEMKAFLKGQAIRLLLIHLPGGVDYRTNIQ
TFTVAAEVQEELCRQMGITEPQEVQEFALFLIKEKSQLVRPLQPAEYLNSVVVDQDVSLHSGGSTG
RPHCTSITPPTSAPTTARCCGTTFRGSCQSAPRQTRSSPGWPPCSTSARPTGIPPQGRTC

Figure 7. HMRP2 partial DNA sequence--shorter clone (3780 bp)

CGGCAGCAGCAGGCTCGGGCCTCCGAGGCTGCGTCCCAGGCCTCACCCTCAGCCGTCACCTCCAAG
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TATTTCCAGAGGATGGGGCAGCCACAGATCACAGTGAGGACGATGAAGCCCCCGGCCAAGGTCCAC
ATCCCCCAGGGGGAAGCGCAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGCAGGAGGAGCAA
GAAGTGGAAACAAGAGCAGCGCCGTCCCCTCCTCCTCCCCCCATCGTGAAGAAGCCATTGAAGCAA
GGTGGGGCCAAAGCTCCAAAAGAGGCTGAGGCTGAGCCAGCCAAGGAGACAGCGGCCAAGGGCCAT
GGCCAAGGGCCAGCCCAAGGCAGGGGGACTGTGGTGCGCAGTCAGACTCCAAGCCCAAGCGGCCAC
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CCCCGCCAGCTGTGGCTCCTCGACCCAAGGCCCCGCTACAGCTTGGGCCCTCTAGCTCCATCAAGG
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TCATTGAGGCCATGAGCCAGCTGCCCCTCTTCGGCTACACCGTCTATGGGGTGCTGCGAGTGAGCAT
GCAGGCCCTGTCCGGACCCACTCTCCTGGGGCTCAACCGCCAGCATCTCATCCTCATGGACCCCAG
CTCCCAGAGCCTGTACTGCCGCATTGCCCTGAAGAGCCTGCAGCGGCTCCACCTGCTAAGCCCTCT
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GGGGCACCTGAGGTTGCCCAGTCTGAGGGAGATGCCCACCCGACCCCAGGCTCCGCCCAGGCCCCA
CATTAGCACAAGCCCAGGCATGGGAGAAACAGCTGCTGAGGAAATAAAACTCCCTAAAAAAAAAAA
AAAAAAAAAAAAAAAAAA

Figure 8.

```
mMRP: 914  MYQSRPGPVAVPVQPTRPIKTFQKKNDPKDEALAKLGINGVHL-PLSTSPNQGKSSPPAV 972
           MYQSRPGPV VPVQP+RP K F +K DPKDEALAKLGING H  P   SP+ GK  PPAV
hMRP: 1    MYQSRPGPVPVPVQPSRPPKAFLRKIDPKDEALAKLGINGAHSSPPMLSPSPGKGPPPAV 60

mMRP: 973  VPRPKARPRLEPSLSIQEKQGPLRDLFGPCSPNPPTAPAPPPPPALPPPLSGEPKTPSVE 1032
            PRPKA  +L PS SI+EKQGPL DLFG      P A  PPPPPA P PL  +P T S E
hMRP: 61   APRPKAPLQLGPSSSIKEKQGPLLDLFGQ---KLPIAHTPPPPPAPPLPLPEDPGTLSAE 117

mMRP: 1033 SHALTEPMEDKNISTKLLVPSGSVCFSYANAPWKLFLRKEVFYPRENFSHPYCLSLLCQQ 1092
              LT+P+ED+ +ST+LL PSGSVCFSY   PWKLFLRKEVFYPRENFSHPY L LLC+Q
hMRP: 118  RRCLTQPVEDQGVSTQLLAPSGSVCFSYTGTPWKLFLRKEVFYPRENFSHPYYLRLLCEQ 177

mMRP: 1093 ILRDTFTESCTRISQDERHKMKGLLGDLEVSLETLDIVEDSIKKRIVVAARDNWANYFSR 1152
           ILRDTF+ESC RISQ+ER KMK LLG LEV L++L   EDS+KKRIVVAARDNWANYFSR
hMRP: 178  ILRDTFSESCIRISQNERRKMKDLLGGLEVDLDSLTTTEDSVKKRIVVAARDNWANYFSR 237

mMRP: 1153 IFPVSGESGSDVQLLGVSHRGLRLLKVTQSPSFHLDQLKTLCSYSYAEVLTVQCRGRSTL 1212
            FPVSGESGSDVQLL VSHRGLRLLKVTQ P    DQLK LCSYS+AEVL V+CRG STL
hMRP: 238  FFPVSGESGSDVQLLAVSHRGLRLLKVTQGPGLRPDQLKILCSYSFAEVLGVECRGGSTL 297

mMRP: 1213 ELSLKNEQLILHTAWARAIKAMVDLFLSELRKDSGYVIALRSYITDDNSLLSFHRGDLIR 1272
           ELSLK+EQL+LHTA ARAI+A+V+LFL+EL+KDSGYVIALRSYITD+ SLLSFHRGDLI+
hMRP: 298  ELSLKSEQLVLHTARARAIEALVELFLNELKKDSGYVIALRSYITDNCSLLSFHRGDLIK 357

mMRP: 1273 LLPVTALEPGWQFGSAGGRSGLFPDDVVQPAAAPDLSFSLGKRNSWQR 1320
           LLPV  LEPGWQFGSAGGRSGLFP D+VQPAAAPD SFS  +R+ W +
hMRP: 358  LLPVATLEPGWQFGSAGGRSGLFPADIVQPAAAPDFSFSKEQRSGWHK 405
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Identities = 302/408 (74%), Positives = 334/408 (81%), Gaps = 4/408 (0%)

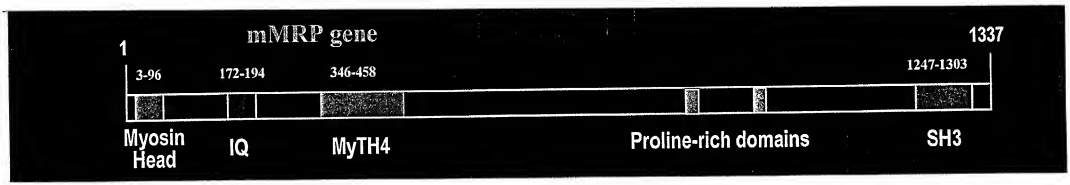

FIGURE 9

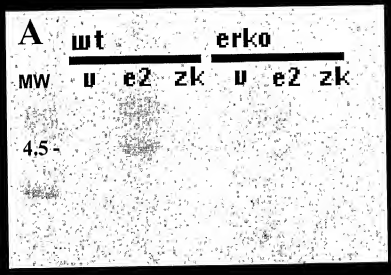

FIGURE 10

Regulation of mMRP Genes by Estrogen.

Northern hybridization of liver RNA from WT and ERKO mice treated with vehicle (V), 17β–estradiol (E2), and antiestrogen ZK compound. The myosin-related protein gene was only detected after E2 treatment in WT mouse.

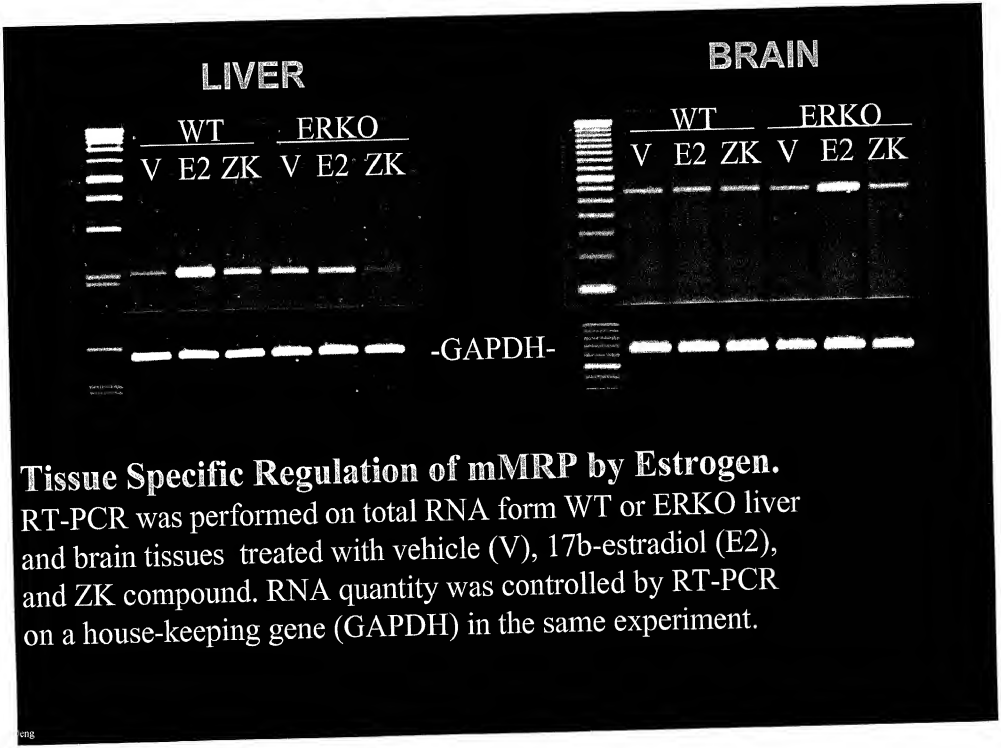

FIGURE 11

Tissue Specific Regulation of mMRP by Estrogen.
RT-PCR was performed on total RNA form WT or ERKO liver and brain tissues treated with vehicle (V), 17b-estradiol (E2), and ZK compound. RNA quantity was controlled by RT-PCR on a house-keeping gene (GAPDH) in the same experiment.

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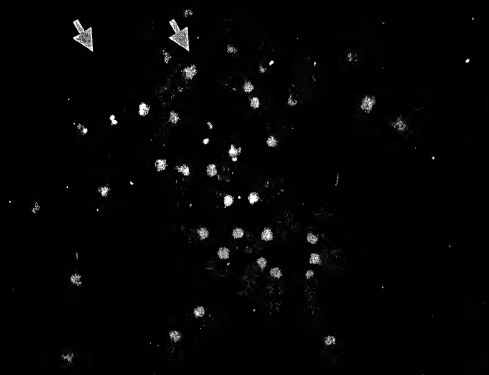
Chromosomal Localization of Mouse MRP



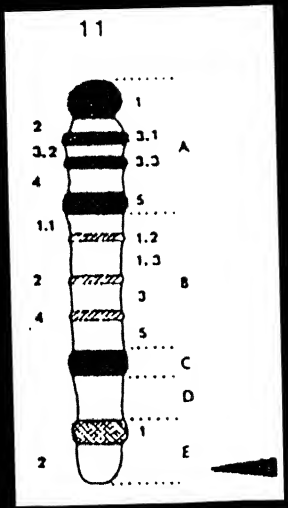


FIGURE 12

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Chromosomal Localization of Human MRP

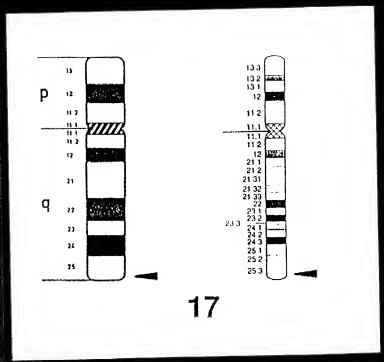

FIGURE 13